

CLAIMS

1. A control system for electrical equipment comprising an electrical equipment group including at least one piece of electrical equipment and a control unit or units connected to said electrical equipment group, wherein:

a GUI for controlling said electrical equipment group has a dual structure comprising a functional GUI with respect to the function of said electrical equipment and a main GUI with respect to said whole control system for electrical equipment;

said electrical equipment has a functional GUI data storage means for storing GUI data for said functional GUI; and

said control unit has a main GUI data storage means for storing GUI data for said main GUI and a GUI processing software storage means for storing a GUI processing software for providing said GUI based on each of said GUI data for said functional GUI and said main GUI and for controlling said electrical equipment.

2. A control system for electrical equipment according to Claim 1, wherein said main GUI has a function to perform the process including display of an initial and/or final screen, display of menu, change of a screen and/or voice message corresponding to a condition of said electrical equipment group, and storage and/or invoking of the last final condition of the control system for electrical equipment, and said functional GUI has a function to perform the process including control of the corresponding electrical equipment, display of a condition of the corresponding electrical equipment, and storage and/or invoking of the last final condition of the control system for electrical equipment.

3. A control system for electrical equipment according to Claim 1, wherein each of said GUI data comprises GUI transition data defining the state transition of a GUI screen and/or the movement of

object(s) constituting said GUI and GUI layout data defining the layout and/or design of said object(s).

4. A control system for electrical equipment according to Claim 3, wherein said GUI layout data is described in text.

5. A control system for electrical equipment according to Claim 1, wherein said system further has a GUI data transfer and storage means for transferring and storing the GUI data of the functional GUI corresponding to the electrical equipment connected upon the start-up of the control system for electrical equipment to the control unit, and said GUI is provided by said GUI processing software based on the GUI data stored in the GUI data transfer and storage means.

6. A control system for electrical equipment according to Claim 5, wherein the GUI data of said main GUI is also transferred to, and stored in, said GUI data transfer and storage means.

7. A control system for electrical equipment according to Claim 5, wherein said main GUI data storage means functions also as said GUI data transfer and storage means.

8. A control system for electrical equipment according to Claim 5, wherein said control unit further has a connected electrical equipment storage means for registering the electrical equipment connected to the control unit upon the last shut-down of the control system for electrical equipment, and thereby, among the electrical equipment connected to the control unit upon the start-up of the control system for electrical equipment, for the electrical equipment consistent with those registered in the connected electrical equipment storage means, the GUI data which has been stored in said GUI data transfer and storage means is used without newly transferring and storing the GUI data of the functional GUI corresponding to the electrical equipment.

9. A control system for electrical equipment

according to Claim 8, wherein said control unit further has a GUI data erasing means for erasing, from said GUI data transfer and storage means, the GUI data of the functional GUI corresponding to the electrical equipment inconsistent with those connected to the control system for electrical equipment upon the start-up thereof, among the electrical equipment corresponding to the GUI data registered in said GUI data transfer and storage means.

10. A control system for electrical equipment according to Claim 9, wherein said GUI data erasing means further has a function to maintain the GUI data of the functional GUI corresponding to the electrical equipment previously registered, rather than erase it.

11. A control system for electrical equipment according to Claim 1, wherein said system further has a whole GUI data storage means for previously storing GUI data of the functional GUI corresponding to the electrical equipment connectable to said control unit and a GUI data extraction means for extracting the GUI data corresponding to the electrical equipment connected upon the start-up of the control system for electrical equipment from the GUI data stored in the whole GUI data storage means, and said GUI processing software provides said GUI based on the GUI data extracted from the whole GUI data storage means by the GUI data extraction means.

12. A control system for electrical equipment according to Claim 5, wherein said system further has an electrical equipment connection number limiting means for limiting the number of the pieces of electrical equipment connected to said control unit in accordance with the capacity of the storage means for storing GUI data.

13. A control system for electrical equipment according to Claim 1, wherein said system further has a function to update said main GUI and/or said functional GUI by updating all or part of the GUI data stored in said main GUI data storage means and/or said functional GUI data storage means and/or said GUI data transfer and

storage means based on the GUI data stored in the functional GUI data storage means of electrical equipment to be newly connected.

14. A control system for electrical equipment according to Claim 1, wherein said control unit is provided with drive(s) for a external storage medium, and further has a function to update said main GUI and/or said functional GUI by reading the GUI layout data stored in the external medium and, based on the GUI layout data, updating all or part of the GUI data stored in said main GUI data storage means and/or the functional GUI data storage means and/or the GUI data transfer and storage means.

15. A control system for electrical equipment according to Claim 1, wherein said system further comprises a web browser, and said GUI data is described in XML, and said system further comprises an XML parser which is shared by said web browser and said GUI processing software.

16. A control system for electrical equipment according to Claim 15, wherein said system further has a function to convert data, which is not GUI data described in XML which can be processed by said GUI processing software, into GUI data described in XML which can be processed by said GUI processing software.

17. A software structure for GUI processing, in a control system for electrical equipment comprising an electrical equipment group including at least one piece of electrical equipment and a control unit or units connected to said electrical equipment group, providing a GUI for controlling said electrical equipment group, wherein:

said GUI has a dual structure comprising a functional GUI with respect to the function of said electrical equipment and a main GUI with respect to said whole control system for electrical equipment;

said software structure for GUI processing

comprises functional GUI data defining said functional GUI, main GUI data defining said main GUI, and a GUI processing software for providing said GUI based on each of said GUI data and for controlling said electrical equipment; and

each of said GUI data comprises GUI transition data defining the state transition of a GUI screen and/or the movement of object(s) constituting said GUI and GUI layout data defining the layout and/or design of said object(s).

18. A method for providing a GUI for controlling an electrical equipment group in a control system for electrical equipment comprising an electrical equipment group including at least one piece of electrical equipment and a control unit or units connected to said electrical equipment group, comprising the steps of:

providing said electrical equipment with a functional GUI data storage means for storing GUI data for a functional GUI with respect to the function of said electrical equipment;

providing said control unit with a main GUI data storage means for storing GUI data for a main GUI with respect to said whole control system for electrical equipment and a GUI processing software storage means for storing a GUI processing software for providing said GUI based on each of said GUI data for said functional GUI and said main GUI and for controlling said electrical equipment; and

providing said GUI for controlling said electrical equipment group, having a dual structure comprising said functional GUI and said main GUI, based on said GUI data for said functional GUI stored in said functional GUI data storage means of said electrical equipment and said GUI data for said main GUI stored in said main GUI data storage means of said control unit, through said GUI processing software stored in said GUI processing software storage means of said control unit.